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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Gurevich et al.	Examiner:	Jared Fureman
Serial No.:	10/648,176	Group:	Art Unit 2876
Filed:	August 25, 2003	Docket:	1400-42 (1575)
For:	AXIAL CHROMATIC ABERRATION AUTO-FOCUSING SYSTEM AND METHOD		
Dated:	February 28, 2007		

Mail Stop: Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPELLANTS' BRIEF

Sir:

Enclosed please find APPELLANTS' BRIEF ON APPEAL in triplicate.

Also enclosed is a check in the amount of $500.00 to cover the appeal fee.

If the enclosed check is insufficient for any reason or becomes detached, please charge the required fee under 37 C.F.R. § 1.17 to Deposit Account No. 50-2140. Also, in the event any additional extensions of time are required, please treat this paper as a petition to extend the time as required and charge Deposit Account No. 50-2140. TWO (2) COPIES OF THIS SHEET ARE ENCLOSED.

Respectfully submitted,

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Dated: February 28, 2007

Maria Goldman

PATENT
DOCKET NO. 1400-42

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANTS:	Vladimir Gurevich, et al.	**EXAMINER:** Jared Fureman	
SERIAL NO.:	10/648,176	**ART UNIT:** 2876	
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APPELLANTS' BRIEF ON APPEAL

Sir:

Appellants herewith respectfully present their Brief on Appeal as follows:

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8(a)

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Dated: 2/28/07

Maria Goldman
(Name of Person Mailing Envelope)

Maria Goldman
(Signature of Person Mailing Envelope)

I. REAL PARTIES IN INTEREST

The real parties in interest are Vladimir Gurevich, Mark Krichever, Bradley S. Carlson and Chinh Tan.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellants' knowledge and belief, there are no other related appeals or interferences for this application.

III. STATUS OF CLAIMS

Claims 1-26 are pending in this application with Claims 1, 9, 15, 20 and 25 being in independent form. Claim 1-26 are rejected in the Final Office Action mailed on November 21, 2006. Claims 1-26 are the subject of this appeal. Claims 1-26 are presented in the Appendix of Claims.

IV. STATUS OF AMENDMENTS

A response to an Office Action mailed on May 3, 2006 was filed on September 5, 2006. A Final Office Action was mailed on November 21, 2006 rejecting all of the pending claims, i.e., Claims 1-26. This Appeal Brief is in response to the Final Office Action that rejected Claims 1-26. Appellants filed an RCE on March 2, 2006 in response to an Advisory Action mailed on March 1, 2006. The Office Action mailed on May 3, 2006 was in response to the RCE.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A first aspect of the present disclosure, as claimed in independent Claim 1, is an optical code reading system 100 for imaging and decoding an optical code 114. The optical code reading system 100 comprises an optical code reader 200 comprising an image sensor 130 for imaging said optical code 114 and generating at least one data signal representative of at least one parameter of at least one wavelength component of said optical code 114 impinging onto said image sensor 130, and at least one lens 170 positioned for movement along an optical axis of said optical code reader 200. Each of said at least one data signal represents a particular color. The optical code reading system 100 further comprises a signal processor 140 comprising means for performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, and means for determining an amount of movement of said at least one lens 170 for adjusting a focus quality of an image corresponding to said optical code 114 and impinged onto said image sensor 130, such that said amount of movement is determinative by data signals representing one or more colors. The analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value. The optical code reading system 100 further comprises an actuator 160 operatively coupled to said at least one lens 170 for moving said at least one lens 170 along said optical axis of said optical code reader 200 by at least the determined amount for adjusting the focus quality of said image; and a decoder 212 for decoding data encoded by said image.

The means for performing the analysis and the means for determining the amount of movement of the at least one lens 170 are embodied as a set of programmable instructions

configured for execution by the signal processor 140 or as logic circuitry implemented in an ASIC as described in Appellants' specification at page 18, lines 3-11.

The optical code reading system as recited by Claim 1 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 18, lines 3-11; page 20, lines 17-21; and FIGs. 1-5.

A second aspect of the present disclosure, as claimed in independent Claim 9, is a method for imaging and decoding an optical code 114. The method comprises the steps of imaging said optical code 114 by an image sensor 130 and generating at least one data signal representative of at least one parameter of at least one wavelength component of said optical code 114 impinging onto said image sensor 130. Each of said at least one data signal represents a particular color. The method further comprises performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component. The analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value. The method further comprises determining an amount of movement of at least one lens 170 based on said analysis for adjusting a focus quality of an image corresponding to said optical code 114 and impinged onto said image sensor 130, such that said amount of movement is determinative by data signals representing one or more colors. The method further comprises moving said at least one lens 170 by at least the determined amount for adjusting the focus quality of said image; and decoding data encoded by said image.

The method as recited by Claim 1 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 20, line 17 to page 21, line 5; and FIGs. 1-5.

A third aspect of the present disclosure, as claimed in independent Claim 15, relates to a system for adjusting a focus quality of an image impinging onto an image sensor 130 and for decoding data encoded by said image. The system comprises means for generating at least one data signal representative of a parameter of at least one wavelength component of said image, wherein each of said at least one data signal represents a particular color; and means for performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component. The analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value. The system further comprises an actuator 160 for moving at least one lens 170 in accordance with the analysis for adjusting the focus quality of said image, such that an amount of movement of said at least one lens 170 is determinative by data signals representing one or more colors; and a decoder 212 for decoding data encoded by said image.

The means for generating the at least one data signal is embodied within the image sensor 130 and/or associated circuitry, as described in Appellants' specification at page 11, lines 6-7, or by the processor 140 executing a set of programmable instructions, as described in Appellants' specification at page 11, lines 8-10. The means for performing the analysis are embodied as a set of programmable instructions configured for execution by a signal processor 140 or as logic circuitry implemented in an ASIC as described in Appellants' specification at page 18, lines 3-

11.

The system as recited by Claim 15 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 11, lines 6-13; page 20, line 17-21; and FIGs. 1-5.

A fourth aspect of the present disclosure, as claimed in independent Claim 20, relates to a method a for adjusting a focus quality of an image impinging onto an image sensor 130 and for decoding data encoded by said image. The method comprises the step of generating at least one data signal representative of a parameter of at least one wavelength component of said image. Each of said at least one data signal represents a particular color. The method further comprises performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value. The method further comprises moving at least one lens 170 in accordance with the analysis for adjusting the focus quality of said image, such that an amount of movement of said at least one lens is determinative by data signals representing one or more colors; and decoding data encoded by said image.

The method as recited by Claim 20 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 20, line 17 to page 21, line 5; and FIGs. 1-5.

A fifth aspect of the present disclosure, as claimed in independent Claim 25, relates to a method for determining a focus discriminator for a focusing system 100. The method comprises

the step of generating a first data signal representative of a parameter of a first wavelength component of an image impinged onto an image sensor 130 of said focusing system 100. The method further comprises generating a second data signal representative of a parameter of a second wavelength component of said image; generating a third data signal representative of a parameter of a third wavelength component of said image; and performing an analysis by subtracting a value indicative of the parameter of the first wavelength component from a value indicative of the parameter of the second wavelength component to obtain a difference. The difference is a focus discriminator indicating whether said image requires focusing by said focusing system, and wherein said analysis is performed while maintaining amplitude values respectively corresponding to the first, the second and the third data signals at substantially the same value. The method further comprises decoding data encoded by said image.

The method as recited by Claim 25 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 12, line 16 to page 13, line 20; page 20, line 17 to page 21, line 5; and FIGs. 1-5.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 1-26 are unpatentable under 35 U.S.C. §103(a) over the Yoshida reference (EP 0 335 656 A1).

VII. ARGUMENT

I. REJECTION OF CLAIMS 1-26

Independent Claims 1, 9, 15, 20 and 25 and Dependent Claims 2-8, 10-14, 16-19, 21-24 and 26

Claims 1-26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yoshida (EP 0 335 656). Appellants believe that the pending independent claims are patentable over the teachings of the cited reference. In particular, it is believed that independent Claims 1, 9, 15, 20 and 25 are patentable over the teachings of Yoshida.

Yoshida is directed to an automatic focus control apparatus particularly suitable for use in **auto-focus television cameras** as stated throughout the written description of Yoshida. There is no disclosure or suggestion in Yoshida of a decoder for decoding data encoded by an image as recited by Appellants' independent Claims 1 and 15. Further, there is no disclosure or suggestion in Yoshida of decoding data encoded by an image as recited by Appellants' independent Claims 9, 20 and 25.

The apparatus described by Yoshida comprises zoom lens 2; image pick-up means (i.e., image pick-up element 3, pre-amplifying circuit 4, signal processing circuit 5, and matrix circuit 6) for picking up an image of an object by means of zoom lens 2; amplitude value detecting means (i.e., band-pass filter circuits 7A, 7B, 7C, detecting circuits 8A, 8B, and 8C, selector switch 9 and A/D converter 12) for detecting the amplitude value of the color signals SB, SG and SR derived from the image pick-up means; and auto-focus control circuit 10. See column 3, lines 51-60 and FIG. 2.

In the Final Office Action on the top of page 10, the Examiner states that "it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the system and method as taught by Yoshida, **the reader being an optical code reader [instead of a television camera]**; the target being an optical code; a decoder for decoding data encoded by said image; the processor for performing said analysis until data is decodable by said decoder; the optical code reader further comprising an illumination apparatus for illuminating a field of view, said field of view including the optical code; in order to take advantage of the improved auto-focus system and method as taught by Yoshida in an optical code reader."

Appellants respectfully disagree with the Examiner's assertions. As set forth in the MPEP Section 2143, to establish a prima facie case of obviousness (35 U.S.C. §103), there are three basic requirements or prongs: (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference(s) or to combine the teachings; (2) a reasonable expectation of success; and (3) the reference(s) teach or suggest all of the claim limitations.

Yoshida is directed to an automatic focus control apparatus **particularly suitable for use in auto-focus television cameras**. It is respectfully submitted that Yoshida fails to disclose or suggest all of the claim limitations recited by Appellants' independent claims as required by the third requirement or prong listed above in order to establish a prima facie case of obviousness. In particular, Yoshida fails to disclose or suggest the following claim limitations recited by Appellants' independent claims: an optical code reading system comprising and optical code reader for imaging an optical code as recited by Appellants independent Claim 1; a decoder for decoding data encoded by an image as recited by Appellants independent Claims 1 and 15; a

method comprising the step of imaging an optical code as recited by Appellants independent Claim 9; and a method comprising the step of decoding data encoded by an image as recited by Appellants independent Claims 9, 20 and 25.

It is also respectfully submitted that there is no suggestion or motivation as required by the first requirement or prong listed above in order to establish a prima facie case of obviousness, either in Yoshida or in the knowledge generally available to one of ordinary skill in the art at the time of the present invention, to modify the television camera described by Yoshida in order to provide to provide Appellants' optical code reading system having a decoder for decoding data encoded by an image as recited by Claim 1, system for adjusting focus quality of an image having a decoder for decoding data encoded by the image as recited by Claim 15, and methods including the step of decoding data encoded by an image as recited by Claims 9, 20 and 25.

In particular, one of ordinary skill in the art at the time of the present invention would not have looked to modify the television camera described by Yoshida to provide an optical code reading system comprising an optical code reader for imaging an optical code; a signal processor comprising means for performing an analysis utilizing principles of axial chromatic aberration; an actuator operatively coupled to at least one lens for moving the at least one lens along an optical axis of the optical code reader; and a decoder for decoding data encoded by an image, as partially recited by Appellants' Claim 1, and similarly recited by Appellants' Claim 9, as well as partially recited by Appellants' Claim 15 ("a decoder for decoding data encoded by said image"), Claim 20 ("decoding data encoded by said image") and Claim 25 ("decoding data encoded by said image").

In closing, the Examiner on the bottom of page 10 of the Final Office Action states that Yoshida states "The invention can also be applied to other apparatus such as image pick-up apparatus, a camera and so on that are used to pick up a still picture." (column 8, lines 12-15 of Yoshida). The Examiner then states that "this is an explicit suggestion by Yoshida that his invention can be combined with other image capture apparatus."

Assuming arguendo that Yoshida's statement is an explicit suggestion that his invention can be combined with other image capture apparatus and Appellants agree with this statement, the "explicit suggestion" only satisfies the first requirement or prong cited above in establishing a prima facie case of obviousness; the second and third requirements or prongs for establishing a prima facie case of obviousness are still not satisfied. That is, Yoshida still fails to disclose or suggest all of the claim limitations recited by Appellants independent Claims 1, 9, 15, 20 and 25 (third requirement for establishing a prima facie case of obviousness). Further, there is no showing, implicit or explicit, that by applying the invention disclosed by Yoshida to an optical code reading system as recited by Appellants' independent Claim 1 and system for adjusting a focus quality of an image impinging onto an image sensor as recited by Appellants' independent Claim 15 would provide a reasonable expectation of success (that is a functional embodiment of Appellants' claimed systems and methods) in order to satisfy the second requirement for establishing a prima facie case of obviousness.

Therefore, reconsideration and withdrawal of the rejection is respectfully requested and allowance of independent Claims 1, 9, 15, 20 and 25 is earnestly solicited.

Dependent Claims 2-8, 10-14, 16-19, 21-24 and 26 depend directly or indirectly from independent Claims 1, 9, 15 and 20 and are therefore patentable for at least the reasons given

above for independent Claims 1, 9, 15 and 20. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested and allowance of the dependent claims is earnestly solicited.

II. CONCLUSION

Independent Claims 1, 9, 15, 20 and 25 and their respective dependent claims are patentable over the cited reference and therefore the rejection with respect to these claims should be reversed.

Respectfully submitted,

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Attorney for Appellant

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CLAIMS APPENDIX

1. An optical code reading system for imaging and decoding an optical code, said optical code reading system comprising:

an optical code reader comprising an image sensor for imaging said optical code and generating at least one data signal representative of at least one parameter of at least one wavelength component of said optical code impinging onto said image sensor, and at least one lens positioned for movement along an optical axis of said optical code reader, wherein each of said at least one data signal represents a particular color;

a signal processor comprising means for performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, and means for determining an amount of movement of said at least one lens for adjusting a focus quality of an image corresponding to said optical code and impinged onto said image sensor, such that said amount of movement is determinative by data signals representing one or more colors, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value;

an actuator operatively coupled to said at least one lens for moving said at least one lens along said optical axis of said optical code reader by at least the determined amount for adjusting the focus quality of said image; and

a decoder for decoding data encoded by said image.

2. The optical code reading system according to Claim 1, wherein said processor further comprises means for determining a distance to said optical target by accessing at least one data structure and correlating the at least one value indicative of the parameter of the at least one wavelength component to said distance.

3. The optical code reading system according to Claim 1, further comprising a feedback system, including the image sensor and the signal processor, for repeatedly generating the at least one data signal and performing said analysis, until said signal processor determines the data is decodeable by said decoder.

4. The optical code reading system according to Claim 3, further comprising a controller for controlling the actuation of said actuator.

5. The optical code reading system according to Claim 1, further comprising an illumination apparatus for illuminating a field of view, said field of view including the optical code.

6. The optical code reading system according to Claim 1, wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components.

7. The optical code reading system according to Claim 1, wherein said means for performing said analysis comprises means for performing the steps of:

determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component;

determining whether the difference necessitates movement of said at least one lens along said optical axis, wherein said amount of movement is determined if the difference necessitates movement of said at least one lens; and

determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said difference necessitates movement of said at least one lens.

8. The optical code reading system according to Claim 1, wherein said means for performing said analysis comprises means for performing the steps of:

determining a difference by subtracting said at least one value from a value stored within a memory, or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and

determining whether the difference necessitates movement of said at least one lens along said optical axis, wherein said amount of movement is determined if the difference necessitates movement of said at least one lens.

9. A method for imaging and decoding an optical code, said method comprising the steps of:

imaging said optical code by an image sensor and generating at least one data signal representative of at least one parameter of at least one wavelength component of said optical code impinging onto said image sensor, wherein each of said at least one data signal represents a particular color;

performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value;

determining an amount of movement of at least one lens based on said analysis for adjusting a focus quality of an image corresponding to said optical code and impinged onto said image sensor, such that said amount of movement is determinative by data signals representing one or more colors;

moving said at least one lens by at least the determined amount for adjusting the focus quality of said image; and

decoding data encoded by said image.

10. The method according to Claim 9, further comprising the step of determining a distance to said optical target by accessing at least one data structure and correlating the at least one value indicative of the parameter of the at least one wavelength

component to said distance.

11. The method according to Claim 9, further comprising the step of repeatedly generating the at least one data signal and performing said analysis, until said data is decodeable by said decoder.

12. The method according to Claim 9, wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components.

13. The method according to Claim 9, wherein said step of performing an analysis comprises the steps of:

determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component;

determining whether the difference necessitates movement of said at least one lens; and

determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said difference necessitates movement of said at least one lens.

14. The method according to Claim 9, wherein said step of performing an analysis comprises the steps of:

determining a difference by subtracting said at least one value from a value stored within a memory, or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and

determining whether the difference necessitates movement of said at least one lens.

15. A system for adjusting a focus quality of an image impinging onto an image sensor and for decoding data encoded by said image, said system comprising:

means for generating at least one data signal representative of a parameter of at least one wavelength component of said image, wherein each of said at least one data signal represents a particular color;

means for performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value;

an actuator for moving at least one lens in accordance with the analysis for adjusting the focus quality of said image, such that an amount of movement of said at least one lens is determinative by data signals representing one or more colors; and

a decoder for decoding data encoded by said image.

16. The system according to Claim 15, wherein said means for performing an analysis comprises means for determining a distance to an optical target corresponding to said image by accessing at least one data structure and correlating the at least one value indicative of the parameter of the at least one wavelength component to said distance.

17. The system according to Claim 15, wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components.

18. The system according to Claim 15, wherein said means for performing an analysis comprises:

means for determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component;

means for determining whether the difference necessitates movement of said at least one lens; and

means for determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said means for determining whether the difference necessitates movement of said at least one lens determines movement is necessitated.

19. The system according to Claim 15, wherein said means for performing an analysis comprises:

means for determining a difference by subtracting said at least one value from a

value stored within a memory, or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and

means for determining whether the difference necessitates movement of said at least one lens.

20. A method for adjusting a focus quality of an image impinging onto an image sensor and for decoding data encoded by said image, said method comprising the steps of:

generating at least one data signal representative of a parameter of at least one wavelength component of said image, wherein each of said at least one data signal represents a particular color;

performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value;

moving at least one lens in accordance with the analysis for adjusting the focus quality of said image, such that an amount of movement of said at least one lens is determinative by data signals representing one or more colors; and

decoding data encoded by said image.

21. The method according to Claim 20, wherein said step of performing an analysis comprises the step of determining a distance to an optical target corresponding to said

image by accessing at least one data structure and correlating the at least one value indicative of the parameter of the at least one wavelength component to said distance.

22. The method according to Claim 20, wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components.

23. The method according to Claim 20, wherein said step of performing an analysis comprises the steps of:

determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component;

determining whether the difference necessitates movement of said at least one lens; and

determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said step of determining whether the difference necessitates movement of said at least one lens determines movement is necessitated.

24. The method according to Claim 20, wherein said step of performing an analysis comprises the steps of:

determining a difference by subtracting said at least one value from a value stored within a memory, or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and

determining whether the difference necessitates movement of said at least one lens.

25. A method for determining a focus discriminator for a focusing system, said method comprising the steps of:

generating a first data signal representative of a parameter of a first wavelength component of an image impinged onto an image sensor of said focusing system;

generating a second data signal representative of a parameter of a second wavelength component of said image;

generating a third data signal representative of a parameter of a third wavelength component of said image;

performing an analysis by subtracting a value indicative of the parameter of the first wavelength component from a value indicative of the parameter of the second wavelength component to obtain a difference, wherein said difference is a focus discriminator indicating whether said image requires focusing by said focusing system, and wherein said analysis is performed while maintaining amplitude values respectively corresponding to the first, the second and the third data signals at substantially the same value; and

decoding data encoded by said image.

26. The method according to Claim 25, wherein said method utilizes principles of axial chromatic aberration, wherein a first wavelength having said first wavelength component has an optimum focus at a first focus plane and a second wavelength having said

second wavelength component has an optimum focus at a second focus plane, and wherein said first and second focus planes are different due to axial chromatic aberration.

27. (Cancelled)

28. (Cancelled)

EVIDENCE APPENDIX

There is no evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131 or 1.132 or of any other evidence entered by the examiner and relied upon by Appellant in the appeal.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings by a court or the Board.

I. <u>REAL PARTIES IN INTEREST</u>

The real parties in interest are Vladimir Gurevich, Mark Krichever, Bradley S. Carlson and Chinh Tan.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellants' knowledge and belief, there are no other related appeals or interferences for this application.

III. STATUS OF CLAIMS

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V. SUMMARY OF CLAIMED SUBJECT MATTER

A first aspect of the present disclosure, as claimed in independent Claim 1, is an optical code reading system 100 for imaging and decoding an optical code 114. The optical code reading system 100 comprises an optical code reader 200 comprising an image sensor 130 for imaging said optical code 114 and generating at least one data signal representative of at least one parameter of at least one wavelength component of said optical code 114 impinging onto said image sensor 130, and at least one lens 170 positioned for movement along an optical axis of said optical code reader 200. Each of said at least one data signal represents a particular color. The optical code reading system 100 further comprises a signal processor 140 comprising means for performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, and means for determining an amount of movement of said at least one lens 170 for adjusting a focus quality of an image corresponding to said optical code 114 and impinged onto said image sensor 130, such that said amount of movement is determinative by data signals representing one or more colors. The analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value. The optical code reading system 100 further comprises an actuator 160 operatively coupled to said at least one lens 170 for moving said at least one lens 170 along said optical axis of said optical code reader 200 by at least the determined amount for adjusting the focus quality of said image; and a decoder 212 for decoding data encoded by said image.

The means for performing the analysis and the means for determining the amount of movement of the at least one lens 170 are embodied as a set of programmable instructions

configured for execution by the signal processor 140 or as logic circuitry implemented in an ASIC as described in Appellants' specification at page 18, lines 3-11.

The optical code reading system as recited by Claim 1 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 18, lines 3-11; page 20, lines 17-21; and FIGs. 1-5.

A second aspect of the present disclosure, as claimed in independent Claim 9, is a method for imaging and decoding an optical code 114. The method comprises the steps of imaging said optical code 114 by an image sensor 130 and generating at least one data signal representative of at least one parameter of at least one wavelength component of said optical code 114 impinging onto said image sensor 130. Each of said at least one data signal represents a particular color. The method further comprises performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component. The analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value. The method further comprises determining an amount of movement of at least one lens 170 based on said analysis for adjusting a focus quality of an image corresponding to said optical code 114 and impinged onto said image sensor 130, such that said amount of movement is determinative by data signals representing one or more colors. The method further comprises moving said at least one lens 170 by at least the determined amount for adjusting the focus quality of said image; and decoding data encoded by said image.

The method as recited by Claim 1 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 20, line 17 to page 21, line 5; and FIGs. 1-5.

A third aspect of the present disclosure, as claimed in independent Claim 15, relates to a system for adjusting a focus quality of an image impinging onto an image sensor 130 and for decoding data encoded by said image. The system comprises means for generating at least one data signal representative of a parameter of at least one wavelength component of said image, wherein each of said at least one data signal represents a particular color; and means for performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component. The analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value. The system further comprises an actuator 160 for moving at least one lens 170 in accordance with the analysis for adjusting the focus quality of said image, such that an amount of movement of said at least one lens 170 is determinative by data signals representing one or more colors; and a decoder 212 for decoding data encoded by said image.

The means for generating the at least one data signal is embodied within the image sensor 130 and/or associated circuitry, as described in Appellants' specification at page 11, lines 6-7, or by the processor 140 executing a set of programmable instructions, as described in Appellants' specification at page 11, lines 8-10. The means for performing the analysis are embodied as a set of programmable instructions configured for execution by a signal processor 140 or as logic circuitry implemented in an ASIC as described in Appellants' specification at page 18, lines 3-

11.

The system as recited by Claim 15 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 11, lines 6-13; page 20, line 17-21; and FIGs. 1-5.

A fourth aspect of the present disclosure, as claimed in independent Claim 20, relates to a method a for adjusting a focus quality of an image impinging onto an image sensor 130 and for decoding data encoded by said image. The method comprises the step of generating at least one data signal representative of a parameter of at least one wavelength component of said image. Each of said at least one data signal represents a particular color. The method further comprises performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value. The method further comprises moving at least one lens 170 in accordance with the analysis for adjusting the focus quality of said image, such that an amount of movement of said at least one lens is determinative by data signals representing one or more colors; and decoding data encoded by said image.

The method as recited by Claim 20 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 20, line 17 to page 21, line 5; and FIGs. 1-5.

A fifth aspect of the present disclosure, as claimed in independent Claim 25, relates to a method for determining a focus discriminator for a focusing system 100. The method comprises

the step of generating a first data signal representative of a parameter of a first wavelength component of an image impinged onto an image sensor 130 of said focusing system 100. The method further comprises generating a second data signal representative of a parameter of a second wavelength component of said image; generating a third data signal representative of a parameter of a third wavelength component of said image; and performing an analysis by subtracting a value indicative of the parameter of the first wavelength component from a value indicative of the parameter of the second wavelength component to obtain a difference. The difference is a focus discriminator indicating whether said image requires focusing by said focusing system, and wherein said analysis is performed while maintaining amplitude values respectively corresponding to the first, the second and the third data signals at substantially the same value. The method further comprises decoding data encoded by said image.

The method as recited by Claim 25 is described throughout Appellants' specification and drawings, such as page 7, line 19 to page 8, line 11; page 12, line 16 to page 13, line 20; page 20, line 17 to page 21, line 5; and FIGs. 1-5.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 1-26 are unpatentable under 35 U.S.C. §103(a) over the Yoshida reference (EP 0 335 656 A1).

VII. ARGUMENT

I. REJECTION OF CLAIMS 1-26

Independent Claims 1, 9, 15, 20 and 25 and Dependent Claims 2-8, 10-14, 16-19, 21-24 and 26

Claims 1-26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yoshida (EP 0 335 656). Appellants believe that the pending independent claims are patentable over the teachings of the cited reference. In particular, it is believed that independent Claims 1, 9, 15, 20 and 25 are patentable over the teachings of Yoshida.

Yoshida is directed to an automatic focus control apparatus particularly suitable for use in **auto-focus television cameras** as stated throughout the written description of Yoshida. There is no disclosure or suggestion in Yoshida of a decoder for decoding data encoded by an image as recited by Appellants' independent Claims 1 and 15. Further, there is no disclosure or suggestion in Yoshida of decoding data encoded by an image as recited by Appellants' independent Claims 9, 20 and 25.

The apparatus described by Yoshida comprises zoom lens 2; image pick-up means (i.e., image pick-up element 3, pre-amplifying circuit 4, signal processing circuit 5, and matrix circuit 6) for picking up an image of an object by means of zoom lens 2; amplitude value detecting means (i.e., band-pass filter circuits 7A, 7B, 7C, detecting circuits 8A, 8B, and 8C, selector switch 9 and A/D converter 12) for detecting the amplitude value of the color signals SB, SG and SR derived from the image pick-up means; and auto-focus control circuit 10. See column 3, lines 51-60 and FIG. 2.

In the Final Office Action on the top of page 10, the Examiner states that "it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the system and method as taught by Yoshida, **the reader being an optical code reader [instead of a television camera]**; the target being an optical code; a decoder for decoding data encoded by said image; the processor for performing said analysis until data is decodable by said decoder; the optical code reader further comprising an illumination apparatus for illuminating a field of view, said field of view including the optical code; in order to take advantage of the improved auto-focus system and method as taught by Yoshida in an optical code reader."

Appellants respectfully disagree with the Examiner's assertions. As set forth in the MPEP Section 2143, to establish a prima facie case of obviousness (35 U.S.C. §103), there are three basic requirements or prongs: (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference(s) or to combine the teachings; (2) a reasonable expectation of success; and (3) the reference(s) teach or suggest all of the claim limitations.

Yoshida is directed to an automatic focus control apparatus **particularly suitable for use in auto-focus television cameras**. It is respectfully submitted that Yoshida fails to disclose or suggest all of the claim limitations recited by Appellants' independent claims as required by the third requirement or prong listed above in order to establish a prima facie case of obviousness. In particular, Yoshida fails to disclose or suggest the following claim limitations recited by Appellants' independent claims: an optical code reading system comprising and optical code reader for imaging an optical code as recited by Appellants independent Claim 1; a decoder for decoding data encoded by an image as recited by Appellants independent Claims 1 and 15; a

method comprising the step of imaging an optical code as recited by Appellants independent Claim 9; and a method comprising the step of decoding data encoded by an image as recited by Appellants independent Claims 9, 20 and 25.

It is also respectfully submitted that there is no suggestion or motivation as required by the first requirement or prong listed above in order to establish a prima facie case of obviousness, either in Yoshida or in the knowledge generally available to one of ordinary skill in the art at the time of the present invention, to modify the television camera described by Yoshida in order to provide to provide Appellants' optical code reading system having a decoder for decoding data encoded by an image as recited by Claim 1, system for adjusting focus quality of an image having a decoder for decoding data encoded by the image as recited by Claim 15, and methods including the step of decoding data encoded by an image as recited by Claims 9, 20 and 25.

In particular, one of ordinary skill in the art at the time of the present invention would not have looked to modify the television camera described by Yoshida to provide an optical code reading system comprising an optical code reader for imaging an optical code; a signal processor comprising means for performing an analysis utilizing principles of axial chromatic aberration; an actuator operatively coupled to at least one lens for moving the at least one lens along an optical axis of the optical code reader; and a decoder for decoding data encoded by an image, as partially recited by Appellants' Claim 1, and similarly recited by Appellants' Claim 9, as well as partially recited by Appellants' Claim 15 ("a decoder for decoding data encoded by said image"), Claim 20 ("decoding data encoded by said image") and Claim 25 ("decoding data encoded by said image").

In closing, the Examiner on the bottom of page 10 of the Final Office Action states that Yoshida states "The invention can also be applied to other apparatus such as image pick-up apparatus, a camera and so on that are used to pick up a still picture." (column 8, lines 12-15 of Yoshida). The Examiner then states that "this is an explicit suggestion by Yoshida that his invention can be combined with other image capture apparatus."

Assuming arguendo that Yoshida's statement is an explicit suggestion that his invention can be combined with other image capture apparatus and Appellants agree with this statement, the "explicit suggestion" only satisfies the first requirement or prong cited above in establishing a prima facie case of obviousness; the second and third requirements or prongs for establishing a prima facie case of obviousness are still not satisfied. That is, Yoshida still fails to disclose or suggest all of the claim limitations recited by Appellants independent Claims 1, 9, 15, 20 and 25 (third requirement for establishing a prima facie case of obviousness). Further, there is no showing, implicit or explicit, that by applying the invention disclosed by Yoshida to an optical code reading system as recited by Appellants' independent Claim 1 and system for adjusting a focus quality of an image impinging onto an image sensor as recited by Appellants' independent Claim 15 would provide a reasonable expectation of success (that is a functional embodiment of Appellants' claimed systems and methods) in order to satisfy the second requirement for establishing a prima facie case of obviousness.

Therefore, reconsideration and withdrawal of the rejection is respectfully requested and allowance of independent Claims 1, 9, 15, 20 and 25 is earnestly solicited.

Dependent Claims 2-8, 10-14, 16-19, 21-24 and 26 depend directly or indirectly from independent Claims 1, 9, 15 and 20 and are therefore patentable for at least the reasons given

above for independent Claims 1, 9, 15 and 20. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested and allowance of the dependent claims is earnestly solicited.

II. CONCLUSION

Independent Claims 1, 9, 15, 20 and 25 and their respective dependent claims are patentable over the cited reference and therefore the rejection with respect to these claims should be reversed.

Respectfully submitted,

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CLAIMS APPENDIX

1. An optical code reading system for imaging and decoding an optical code, said optical code reading system comprising:

an optical code reader comprising an image sensor for imaging said optical code and generating at least one data signal representative of at least one parameter of at least one wavelength component of said optical code impinging onto said image sensor, and at least one lens positioned for movement along an optical axis of said optical code reader, wherein each of said at least one data signal represents a particular color;

a signal processor comprising means for performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, and means for determining an amount of movement of said at least one lens for adjusting a focus quality of an image corresponding to said optical code and impinged onto said image sensor, such that said amount of movement is determinative by data signals representing one or more colors, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value;

an actuator operatively coupled to said at least one lens for moving said at least one lens along said optical axis of said optical code reader by at least the determined amount for adjusting the focus quality of said image; and

a decoder for decoding data encoded by said image.

2. The optical code reading system according to Claim 1, wherein said processor further comprises means for determining a distance to said optical target by accessing at least one data structure and correlating the at least one value indicative of the parameter of the at least one wavelength component to said distance.

3. The optical code reading system according to Claim 1, further comprising a feedback system, including the image sensor and the signal processor, for repeatedly generating the at least one data signal and performing said analysis, until said signal processor determines the data is decodeable by said decoder.

4. The optical code reading system according to Claim 3, further comprising a controller for controlling the actuation of said actuator.

5. The optical code reading system according to Claim 1, further comprising an illumination apparatus for illuminating a field of view, said field of view including the optical code.

6. The optical code reading system according to Claim 1, wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components.

7. The optical code reading system according to Claim 1, wherein said means for performing said analysis comprises means for performing the steps of:

determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component;

determining whether the difference necessitates movement of said at least one lens along said optical axis, wherein said amount of movement is determined if the difference necessitates movement of said at least one lens; and

determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said difference necessitates movement of said at least one lens.

8. The optical code reading system according to Claim 1, wherein said means for performing said analysis comprises means for performing the steps of:

determining a difference by subtracting said at least one value from a value stored within a memory, or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and

determining whether the difference necessitates movement of said at least one lens along said optical axis, wherein said amount of movement is determined if the difference necessitates movement of said at least one lens.

9. A method for imaging and decoding an optical code, said method comprising the steps of:

imaging said optical code by an image sensor and generating at least one data signal representative of at least one parameter of at least one wavelength component of said optical code impinging onto said image sensor, wherein each of said at least one data signal represents a particular color;

performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value;

determining an amount of movement of at least one lens based on said analysis for adjusting a focus quality of an image corresponding to said optical code and impinged onto said image sensor, such that said amount of movement is determinative by data signals representing one or more colors;

moving said at least one lens by at least the determined amount for adjusting the focus quality of said image; and

decoding data encoded by said image.

10. The method according to Claim 9, further comprising the step of determining a distance to said optical target by accessing at least one data structure and correlating the at least one value indicative of the parameter of the at least one wavelength

component to said distance.

11. The method according to Claim 9, further comprising the step of repeatedly generating the at least one data signal and performing said analysis, until said data is decodeable by said decoder.

12. The method according to Claim 9, wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components.

13. The method according to Claim 9, wherein said step of performing an analysis comprises the steps of:

determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component;

determining whether the difference necessitates movement of said at least one lens; and

determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said difference necessitates movement of said at least one lens.

14. The method according to Claim 9, wherein said step of performing an analysis comprises the steps of:

determining a difference by subtracting said at least one value from a value stored within a memory, or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and

determining whether the difference necessitates movement of said at least one lens.

15. A system for adjusting a focus quality of an image impinging onto an image sensor and for decoding data encoded by said image, said system comprising:

means for generating at least one data signal representative of a parameter of at least one wavelength component of said image, wherein each of said at least one data signal represents a particular color;

means for performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value;

an actuator for moving at least one lens in accordance with the analysis for adjusting the focus quality of said image, such that an amount of movement of said at least one lens is determinative by data signals representing one or more colors; and

a decoder for decoding data encoded by said image.

16. The system according to Claim 15, wherein said means for performing an analysis comprises means for determining a distance to an optical target corresponding to said image by accessing at least one data structure and correlating the at least one value indicative of the parameter of the at least one wavelength component to said distance.

17. The system according to Claim 15, wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components.

18. The system according to Claim 15, wherein said means for performing an analysis comprises:

means for determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component;

means for determining whether the difference necessitates movement of said at least one lens; and

means for determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said means for determining whether the difference necessitates movement of said at least one lens determines movement is necessitated.

19. The system according to Claim 15, wherein said means for performing an analysis comprises:

means for determining a difference by subtracting said at least one value from a

value stored within a memory, or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and

means for determining whether the difference necessitates movement of said at least one lens.

20. A method for adjusting a focus quality of an image impinging onto an image sensor and for decoding data encoded by said image, said method comprising the steps of:

generating at least one data signal representative of a parameter of at least one wavelength component of said image, wherein each of said at least one data signal represents a particular color;

performing an analysis utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value;

moving at least one lens in accordance with the analysis for adjusting the focus quality of said image, such that an amount of movement of said at least one lens is determinative by data signals representing one or more colors; and

decoding data encoded by said image.

21. The method according to Claim 20, wherein said step of performing an analysis comprises the step of determining a distance to an optical target corresponding to said

image by accessing at least one data structure and correlating the at least one value indicative of the parameter of the at least one wavelength component to said distance.

22. The method according to Claim 20, wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components.

23. The method according to Claim 20, wherein said step of performing an analysis comprises the steps of:

determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component;

determining whether the difference necessitates movement of said at least one lens; and

determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said step of determining whether the difference necessitates movement of said at least one lens determines movement is necessitated.

24. The method according to Claim 20, wherein said step of performing an analysis comprises the steps of:

determining a difference by subtracting said at least one value from a value stored within a memory, or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and

determining whether the difference necessitates movement of said at least one lens.

25. A method for determining a focus discriminator for a focusing system, said method comprising the steps of:

generating a first data signal representative of a parameter of a first wavelength component of an image impinged onto an image sensor of said focusing system;

generating a second data signal representative of a parameter of a second wavelength component of said image;

generating a third data signal representative of a parameter of a third wavelength component of said image;

performing an analysis by subtracting a value indicative of the parameter of the first wavelength component from a value indicative of the parameter of the second wavelength component to obtain a difference, wherein said difference is a focus discriminator indicating whether said image requires focusing by said focusing system, and wherein said analysis is performed while maintaining amplitude values respectively corresponding to the first, the second and the third data signals at substantially the same value; and

decoding data encoded by said image.

26. The method according to Claim 25, wherein said method utilizes principles of axial chromatic aberration, wherein a first wavelength having said first wavelength component has an optimum focus at a first focus plane and a second wavelength having said

second wavelength component has an optimum focus at a second focus plane, and wherein said first and second focus planes are different due to axial chromatic aberration.

27. (Cancelled)

28. (Cancelled)

EVIDENCE APPENDIX

There is no evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131 or 1.132 or of any other evidence entered by the examiner and relied upon by Appellant in the appeal.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings by a court or the Board.